For additional information you can contact the Tennessee Division of Water Supply at (615) 532-0191, visit the Department's website at www.state.tn.us or call the toll free Statewide Environmental Assistance Center number:

1-888-891-8332

The Tennessee Department of Environment and Conservation is committed to principles of equal opportunity, equal access and affirmative action. Contact the Tennessee Department of Environment and Conservation EEO/AA Coordinator, Taryn Harrison Sloss, (615) 532-5249 or the ADA Coordinator, Isaac Okoreeh-Baah, (615) 532-0059 for further information. Hearing impaired callers may use the Tennessee Relay Service (1-800-848-0298).

Tennessee Department of Environment and Conservation Authorization No. 327819, 3,000 copies. This public document was promulgated at a cost of $0.14 per

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WELLHEAD PROTECTION FACTS

Tennessee Department of Environment and Conservation
Division of Water Supply
Ground Water Management Section
6th Floor, L & C Tower
401 Church Street
Nashville, TN 37243-1549

INTRODUCTION

The Wellhead Protection Program was established to protect public water systems using ground water from contamination. This program has an emphasis on the prevention of ground water contamination due to the difficulty in cleaning up the contamination once it occurs. These drinking water sources are vulnerable to a variety of contaminant sources such as industrial spills, shallow underground injection discharges {referred to by EPA as class V (5) wells} through wells, floor drains and septic tanks, leaks from underground storage tanks, etc.

Much of ground water contamination stems from the misuse and improper disposal of liquid and solid wastes; the illegal dumping or abandonment of household, commercial, or industrial chemicals; the accidental spilling of chemicals from trucks, railways, aircraft, handling facilities, and storage tanks; or the improper siting, design, construction, operation, or maintenance of liquid and solid waste disposal facilities (see Table 1 and 2). Generally, when the potential sources are used and managed properly, ground water contamination is not likely to occur.

More than 89 percent of U. S. public water supply systems draw some or all of their drinking water from sources found underground in rock, sand or gravel. Over one-third of Tennessee's citizens are served by public water systems relying on ground water.

Tennessee's Wellhead Protection Program requires the cooperation of state and local government, private industry and the general public. The official designation of wellhead protection areas provides valuable input and emphasis to government agencies in the siting of facilities and the prioritization and cleanup of contamination sites.

Wellhead protection makes good business sense. It is in an industry's best interest to pay attention to good housekeeping practices if they are located within a wellhead protection area. Substantial spills or leaks from an industry's sloppy housekeeping practices within a wellhead protection area could contaminate a public water supply and subject the owner/operator of the facility to both state and federal enforcement action. Enforcement action can include heavy fines, the cost of the ground water cleanup and paying for additional treatment and monitoring for the water system.

PROTECTION

Facilities in wellhead protection areas that store or handle hazardous substances {such as heavy industrial plants, dry cleaners, gas stations, auto repair workshops, and transportation facilities such as trucking, railroad, bus depots and airports} need to be aware of the potential to contaminant water systems and strictly comply with all regulatory requirements. They should also be encouraged to implement best management practices.

EPA is undertaking an initiative to focus on class V wells in wellhead protection areas. Since these wells place fluids directly into the ground water, they are a sizeable threat to water supplies. The threat to ground water from Class V practices can be significantly reduced by the utilization of best management practices and careful monitoring at permitted facilities within wellhead protection areas.

Table 1 - Sources of Ground Water Contamination

Designed to Discharge	**Designed to Store Treat and/or Dispose (Discharge through unplanned release)**
Septic tanks	Landfills - Industrial hazardous and nonhazardous; municipal sanitary
Injection wells	Open dumps
Dry wells	Surface Impoundments - hazardous, nonhazardous; animal waste lagoons
Non-hazardous waste	Waste tailings and piles, hazardous and nonhazardous
Cooling waters	Materials stockpiles; hazardous and nonhazardous waste, non-waste
Stormwater runoff	Under and Above-ground storage tanks - hazardous, nonhazardous & non-waste
Hazardous waste	Containers (drums) - hazardous, nonhazardous & non-waste
Agricultural drainage	Open burning sites, detonation sites
Automobile service station disposal	Radioactive disposal sites
Industrial process water	**Discharging as Consequences of Other Activities**
Land application	Irrigation practice
Wastewater (spray irrigation) & wastewater (sludge) hazardous waste & nonhazardous waste petroleum refining waste	Application - Pesticide, Fertilizer & De-icing salts
Designed to Retain Substances during Transport or Transmission	Animal feedlot operations
Pipelines hazardous, nonhazardous and non-waste; sewers	Urban runoff
Materials transport and Transfer Operations hazardous and nonhazardous	Mining and mine drainage
Providing Conduit or Inducing Discharge through Altered Flow Patterns	Cemeteries
Modified Sinkholes	Spills and leaks from manufacturing operations
Production Wells Oil and Gas Geothermal/heat pump Recovery Water Supply - drinking, commercial or industrial	

Table 2 - Potentially Harmful Components of Common (Household) Products

Product	Toxic or Hazardous Components
Antifreeze (gasoline or coolant systems)	Methanol, ethylene glycol
Automatic transmission fluid	Petroleum distillates, xylene
Battery acid (electrolyte)	Sulfuric acid
Degreasers for driveways and garages	Petroleum solvents, alcohols, glycol ether
Degreasers for engines and metal	Chlorinated hydrocarbons, toluene, phenols, dichloroperchloroethylene
Engine and radiator flushes	Petroleum solvents, ketones, butanol, glycol ether
Hydraulic fluid (brake fluid)	Hydrocarbons, fluorocarbons
Motor oils and waste oils	Hydrocarbons
Gasoline and jet fuels	Hydrocarbons

Diesel fuel, kerosene, #2 heating oil	Hydrocarbons
Grease, lubes	Hydrocarbons
Rustproofers	Phenols, heavy metals
Car wash detergents	Alkyl benzene sulfonates
Car waxes and polishes	Petroleum distillates, hydrocarbons
Asphalt and roofing tar	Hydrocarbons
Paints, varnishes, stains and dyes	Heavy metals, toluene
Paint and lacquer thinner	Acetone, benzene, toluene, butyl acetate, methyl ketones
Paint and varnish removers, deglossers	Methylene chloride, toulene, acetone, xylene, ethanol, benzene, methanol
Paint brush cleaners	Hydrocarbons, toulene, acetone, methanol, glycol ethers, methyl ethyl ketones
Floor and furniture strippers	Xylene
Metal polishes	Petroleum distillates, isopropanol, petroleum naptha
Laundry soil and stain removers	Hydrocarbons, benzene, trichloroethylene, 1,1,1-trichloroethane
Other solvents	Acetone, benzene
Rock salt	Sodium concentration
Refrigerants	1,1,2-trichloro-1,2,2-trifluoroethane
Bug and tar removers	Xylene, petroleum distillates
Household cleansers, oven cleaners	Xylenols, glycol ethers, isopropanol
Drain cleaners	1,1,1-trichloroethane
Toilet cleaners	Xylene, sulfonates, chlorinated phenols
Cesspool cleaners	Tetrachloroethylene, dichlorobenzene, methylene chloride
Disinfectants	Cresol, xylenols
Pesticides (all types)	Naphthalene, phosphorous, xylene, chloroform, heavy metals, chlorinated hydrocarbons
Photochemicals	Phenols, sodium sulfite, cyanide, silver halide, potassium bromide
Printing ink	Heavy metals, phenol-formaldehyde
Wood preservatives (creosote)	Pentachlorophenols
Swimming pool chlorine	Sodium hypochlorite
Lye or caustic soda	Sodium hydroxide
Jewelry cleaners	Sodium cyanide